

Claim of Priority

The Examiner acknowledges applicants' claim for priority under 35 USC 119. The Examiner states "however, a review of that certified copy, which is in English, indicates that it does not support the present assertion of priority. Support is not found in that certified copy for the invention as presently claimed."

Applicants respectfully disagree. The certified copy is directed to transition metal oxide superconducting materials.

A copy of the European Patent Application number 87100961.9, filed January 23, 1987 corresponding to the priority document is attached as Appendix A. Moreover, the title of the priority document refers to "superconductive compounds ... having a high transition temperature" and further provides examples of transition temperatures greater than 26°K." (see for example column 4, lines 56-58 and column 5, lines 7-8).

The Examiner's attention is directed to the following comments from this document which is referred to herein as the priority document.

- I) The priority document states at column 1, lines 7-19 that:

"The present invention proposes to use compounds having a layer-type structure of the kind known from potassium nickel fluoride K_2NiF_4 . This structure is in particular present in oxides of the general composition RE_2TMO_4 , wherein RE stands for the rare earths (lanthanides) and TM stands for the so-called transition metals. It is a characteristic of the present invention that in the compounds in question, the RE portion is partially substituted by one member of the alkaline earth group of metals or by a combination of the members of this alkaline earth group, and that the oxygen content is at a deficit."

- II) The priority document further states at column 3, lines 39-40, "a first layer-type perovskite-like phase, related to the K_2NiF_4

structure".

III) The priority document defines T_c at column 6, lines 4-5, by referring to the onset of superconductivity, i.e., the value of the critical temperature T_c ".

IV) The priority document further states at column 6, lines 38-43 that "[r]esistivity... measurements, as a function of temperature... show the same general tendency... A drop in resistivity $p(T)$, and a cross-over to diamagnetism at a slightly lower temperature."

V) It is generally known that: "[a] magnetic field... cannot penetrate onto the interior of a superconductor... [p]erfect conductivity implies a time-independent magnetic field in the interior... In a superconductor, the field is not only independent of time, but also zero." (Solid State Physics, N.W. Ashcroft, N.D. Mermin, Saunders College, 1976) (see Appendix B).

VI) It is also well-known that: "[i]n the ideal

case the resistance vanishes completely and discontinuously at a transition temperature. Ts... Actually, the resistance temperature curve does fall more sharply the more the specimen is like a single crystal... [T]he drop always occurs in a measurable temperature range..." (Theory of Superconductivity, M. von Laue, Academic Press, Inc., 1952) (see Appendix C).

Applicants' claim 103 recites (claims 104-108 depend from claim 103):

- A) "providing a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element, and at least one alkaline-earth element".

S.N. 08/303,561

B) "composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature change between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature T_c , the transition-onset temperature T_c being] greater than 26 K".

Support for that part of claim 103 designated as A above is found in the priority document as indicated in I and II above.

Support for that part of claim 103, designated as B above can be found in the priority document in III, IV and V above and in VI above which provides a more detailed explanation of aspects of superconductors as described in the priority document above.

Claim 87 depends from independent claim 86. Support for claims 86 and 87 is found in the priority document in the same way as is support for claims 103-108. Claims 88-89 depend from claim 88. Support for claim 88 is found in the priority document in the same way as for claims 103-108. Claims 97-102 depend from claim

S.N. 08/303,561

96. Support for claims 96-102 is found in the priority document in the same way as in found for claims 103-108. Claims 25-26 depend from claim 24. Support for claim 24 is found in the priority document in the same way as is found for claims 103-108.

S.N. 08/303,561

Objection to Specification and Rejection of Claims 103-108 Under 35
USC 112 - Lack of Support

The specification has been objected to under 35 USC 112, first paragraph. The Examiner states that "the language of claim 103 is not supported by the original specification."

Applicants respectfully disagree. Claim 103 is adequately supported by the original specification. As noted above, claim 103 is supported by the priority document.

The Examiner's attention is directed to the following comments from the specification.

VII) The specification states at page 1, lines 5-10, that "This invention relates to ... superconducting compositions including copper and/or transition metals."

The specification further states at page 5, lines 2-9 that:

"It is another object of the present invention to provide novel superconductive materials that are

multi-valent oxides including transition metals, the compositions having a perovskite-like structure."

It is a further object of the present invention to provide novel superconductive compositions that are oxides including rare earth and/or rare earth-like atoms, together with copper or other transition metals that can exhibit mixed valent behavior."

The specification further states at page 8, lines 1-11, that

"[A]n example of a superconductive composition having high T_c is the composition represented by the formula RE-TM-O, where RE is a rare earth or rare earth-like element, TM is a nonmagnetic transition metal, and O is oxygen. Examples of transition metal elements include Cu, Ni, Cr etc. In particular, transition metals that can exhibit multi-valent states are very suitable. The rare earth elements are typically

elements 58-71 of the periodic table, including Ce, Nd, etc. If an alkaline earth element (AE) were also present, the composition would be represented by the general formula RE-AE-TM-O."

And at page 7, lines 14-15, the specification states that "the rare earths site can also include alkaline earth elements."

The specification at page 6, lines 7-10 states that:

VIII) "The basis for our invention has been described by us in the following previously published article: J.G.Bednorz and K.A. Muller, Zeitschrift für Physik B - Condensed Matter, 64, pp. 189-193, (September 1986)." Another article of interest by us is J.G. Bednorz, K.A. Muller, M. Takashige, Europhysics Letters, 3(3), pp. 379-385 (1987)."

The first article clearly shows in the figures (for example Figure 3 that the resistivity reaches a critical temperature at

S.N. 08/303,561

which it begins to rapidly drop and over a small temperature range goes to zero.

Support for recitation A, above of claims 103-108 can be found in the specification as indicated in VII above. Support for recitation B, above of claims 103-108 can be found in the specification as indicated in VIII above.

S.N. 08/303,561

Objection to Specification and Rejection of Claims Under 35 USC 112, First Paragraph - Enablement

Claims 103-108 have been rejected under 35 USC 112, first paragraph for the reasons set forth in the objections to the specification. Claims 104-108 depend from claim 103. In view of to applicants' comments in regards to the objection to the specification, the Examiner is respectfully requested to withdraw the rejection of claims 103-108 under 35 USC 112.

The specification has been rejection under 35 USC 112, first paragraph as failing to provide an enabling disclosure commensurate with the scope of the claims. The Examiner states that "the present specification is only enabled for compositions comprising $Ba_xLa_{5-x}Cu_5O_y$. The art of high temperature (above 30°K) superconductors is an extremely unpredictable one. Small changes in composition can result in dramatic changes in or loss of superconducting properties. The amount and type of examples necessary to support broad claims increases as the predictability of the art decreases."

The Examiner cites number of see CCPA cases in support of the rejection of claims 103-108 under 35 USC 112, first paragraph: in re Fisher, 166 USPQ 18; in re Angstadt and Griffen, 190 USPQ 214, and in re Coliani, 195 USPQ 150.

S.N. 08/303,561

Applicants respectfully disagree that claims 103-108 are not enabled by the specification.

The specification at page 8, line 1, states that "An example of a superconductive composition having high T_c is the composition represented by the formula RE-TM-O, where RE is a rare earth or rare earth-like element, TM is a nonmagnetic transition metal, and O is oxygen. Examples of transition metal elements include Cu, Ni, Cr, etc. In particular, transition metals that can exhibit multi-valent states are very suitable. The rare-earth elements are typically elements 58-71 of the periodic table, including Ce, Nd, etc. If an alkaline earth element (AE) were also present, the composition would be represented by the general formula RE-AE-TM-O."

The specification further states at page 11, lines 19-24, that "An example of a superconductive compound having a layer-type structure in accordance with the present invention is an oxide of the general composition RE_2TMO_4 , where RE stands for the rare earths (lanthanides) or rare earth-like elements and TM stands for a transition metal."

The composition $RE_2TMO_4:RE$ is referred to at page 24, lines 5-9; $RE_{2-x}TM_xO_{4-y}$ is referred to at page 25, lines 19-21.

The following specific compounds are recited in the application:

$Ba_4La_{5-x}Cu_5O_{5(3-y)}$ at page 10, lines 4, 10, 14. Other compounds are given in the articles to B. Raveau, in Mat. Res. Bull., Vol. 20 (1985) pp. 667-671, and to C. Michel et al. in Rev. Claim. Min. 21 (1984) 407, both of which are incorporated by reference at page 13, lines 4-5.

$La_{2-x}Ba_xCuO_{4-y}$ at page 12, line 13

$La_{2-x}Ba_xNiO_{4-y}$ at page 12, line 13

$La_{2-x}Sn_xNiO_{4-y}$ at page 12, line 17

$Ce_{2-x}Cu_xNiO_{4-y}$ at page 12, line 19

La_2CuO_4 at page 12, line 21

La_2CuO_{4-y} with Sn^{2x} substitution at page 13, line 17

Ba^{2x} and Ca^{2x}

S.N. 08/303,561

$\text{La}_{2-x}\text{Sn}_x\text{CuO}_{4-y}$ at page 17, line 21

$\text{La}_{2-x}\text{Ca}_x\text{CuO}_{4-y}$ at page 17, line 21

$\text{La}_{2-x}\text{Ba}_x\text{CuO}_{4-y}$ at page 18, line 6

La_2CuO_4 :Ba at page 18, line 15

La_2CuO_4 :Ba at page 24, line 6

Nd_2NiO_4 :Sn at page 24, line 9

$\text{La}_2\text{CuO}_{4-y}$ doped with Sn^{2x} , Ca^{2x} and Ba^{2x} at page 25, lines 6-18

The paragraph bridging pages 13 and 14 refer to Ba-La-Cu-O systems having different crystallographic phases having Cu^{3+} and Cu^{2+} ions or Ni^{3+} and Ni_2^+ ions.

The claims under appeal In re Fisher are directed to increasing the potency of substances containing ACTH hormones for injection into human beings. In regards to the rejection for insufficient disclosure under 35 USC 112 the CCPA states that:

"the issue thus presented is whether an inventor with the first to achieve potency of greater than 1.0 for certain types of compositions, which potency was long designed because of its beneficial effects on humans, should be allowed to dominate all compositions having potencies greater than 1.0, thus including future compositions having potencies in excess

S.N. 08/303,561

of those obtainable from his teachings plus ordinary skill." 166 USPQ 18, 23-24 (emphasis in the original).

The CCPA goes on to say in *In re Fisher* that:

"It is apparent that such an inventor should be allowed to dominate the future patentable inventions of others where those inventions were based in some way on his teachings. Such improvements, while unobvious from his teachings, are still within his contribution, since the improvement was made possible by his work. It is equally apparent, however, that he must not be committed to achieve this dominance by claims which are insufficiently supported and hence, not in compliance with the first paragraph of 35 USC 112. That paragraph requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skills in the art... In cases involving unpredictable factors, such as most chemical reactions... the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved." (166 USPQ 18, 24)

Applicants of the present invention have provided the first

S.N. 08/303,561

teaching that transition metal oxides can form a superconductor having a critical temperature in excess of 20°K, therefore, "is apparent that such an [applicant] should be allowed to dominate the future patentable inventions of others when those inventions [are based in some way on applicants] teaching" as stated by the CCPA in *In re Fisher Supra*.

Claim 103 of the present invention recites "a copper oxide compound having a layer-type-perovskite-like crystal structure, the copper oxide compound including at least one rare-earth or rare-earth-like element, and at least one alkaline-earth element". In regard to the stated elements, the rare earth elements are defined in the specification at page 7, lines 9-12 to be "a group IIIB element, such as La." Group IIIB includes Sc, Y, La and Ac, rare earth-like or near rare earth. The rare earth elements are elements 58 to 71. This group contains four elements from group IIIB and fourteen elements from the rare-earth for a total of 18 elements. The alkaline earths contain the elements of Group A which has 6 elements.

The claimed invention in *re Angstadt and Griffen* (190 USPQ 214) involves a method of catalytically oxidizing alkylaromatic hydrocarbons to form a reaction comprising the corresponding hydroperoxides. The method employs catalysts. The Examiner rejected all the claims under 35 USC 112, first and second

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S.N. 08/303,561

paragraphs. The Board's rational for affirming the Examiner's rejection was directed primarily to the enablement required of the first paragraph.

The CCPA stated that:

"what is a maximum concern in the analysis of whether a particular claim is supported by the disclosure in an application, is whether the disclosure contains sufficient teaching regarding the subject matter of the claims as enabled one of skill in the art to make and to use the claimed invention. These two requirements 'how to make' and 'how to use' have some times been referred to in combination as the 'enablement requirement'... The relevancy may be summed up as being whether the scope of enablement provided to one of ordinary skill in the art by the disclosure as such as to be commensurate with the scope or protection sought by the claims. (190 USPQ 214,47 citing In re Moore 169 USPQ).

In the attached affidavits under 37 CFR 132, Dr. T. Dinger and Dr. D. Mitzi state:

"That once a person of skill in the art knows
of a specific transition metal oxide
composition which is superconducting above

26°K, such a person of skill in the art, using the techniques described in the above-identified patent application, which includes all known principles of ceramic fabrication, can make the transition metal oxide compositions encompassed by claims 24-26, 86-90 and 96-108, without undue experimentation or without requiring ingenuity beyond that expected of a person of skill in the art. This is why the work of Bednorz and Müller was reproduced so quickly after their discovery and why so much additional work was done in this field within a short period of their discovery."

In the paragraph at the bottom of page 15 of the specification, it is stated that:

in regard to compositions according to the present invention that "their manufacture generally follows the known principles of ceramic fabrication." Thereafter, an example of a typical manufacturing process is given.

The CCPA in *In re Angstadt and Griffen* further states that:

"we cannot agree with the Board that

Appellants' disclosure is not sufficient to enable one of ordinary skill in the art to practice the invention without undo experimentation. We note that many chemical processes and catalytic processes particularly, are unpredictable, ... , and the scope of enablement varies inversely with the degree of unpredictability involved... The question, then, whether in an unpredictable art, section 112 requires the disclosure of a test with every species covered by a claim. To require such a complete disclosure will apparently necessitate a patent application or applications with 'thousands ' of examples... . More importantly, such a requirement would force an inventor to seek adequate patent protection to carry out a prohibited number of natural experiments. This would tend to discourage inventors in filing patent applications in an unpredictable area since the patent claim would have to be limited those embodiments which are expressly disclosed. A potential infringer could readily avoid 'infringement of such claims' by merely finding another analogous (example) which could be used..." 190 USPQ 124, 218.

The CCPA in *In re Angstadt* further goes on to say

"having decided that appellants are not required to

S.N. 08/303,561

disclose every *species* encompassed by the claims even in an unpredictable art such as the present record presents, each case must be determined on its own facts." 190 USPQ 214, 218. (emphasis in the original).

In regards to the catalyst In re Angstadt and Griffen CCPA further states:

"since appellants have supplied the list of catalysts and have taught how to make or how to use them, we believe that the experimentation required to determine which catalyst will produce hydroperoxide would not be undo and certainly would not 'require ingenuity beyond that to be expected of one of ordinary skill in the art'. 190 USPQ, 214, 218 in re Field v. Connover 170 USPQ, 276, 279 (1971).

As stated in the affidavits of Dr. Dinger and Dr. Mitzi, to make the high temperature superconductors encompassed by claims 24-26, 86-90 and 96-108, using the teaching of the present invention would not require ingenuity beyond that expected of one of ordinary skill in the art.

S.N. 08/303,561

The CCPA in In re Angstadt further states that:

"the basic policy of the Patent Act, which is to encourage disclosure of inventions and thereby to promote progress in the useful arts. To require disclosures in patent applications to transcend the level of knowledge of those skilled in the art would stifle the disclosure of inventions in fields man understands imperfectly." 190 USPQ 214, 219.

The CCPA further states that:

"the certainty which the law requires in patents is not greater than is reasonable." 242 USPQ, 270-271, cited in In re Angstadt. 190 USPQ 214, 219.

The Examiner cited In re Colianni 195 USPQ 150 which applicants believe is not on point since in In re Colianni "[t]here is not a single specific example or embodiment by way of an illustration of how the claimed method is to be practiced." (195 USPQ 150, 152). In contradistinction as noted above, there are numerous examples cited in applicants' specification and incorporated references.

"Showing that the disclosure entails undue experimentation is

S.N. 08/303,561

part of the PTO's initial burden." In re Armbruster 185 USPQ 152, 504.

"The practice approach followed consistently by [the CCPA] ..., places the initial burden on the PTO to show that the enabling disclosure is not commensurate in scope with the claim. Upon such a showing, the burden of rebuttal shifts to applicants". In re Coliani 195 USPQ 150.

"However, [the CCPA] has made it clear that the Patent and Trademark Office must substantiate its rejections for lack of enablement with reasons" In re Armbruster 185 USPQ 152, 153.

The Examiner has merely asserted without support that "the art of high temperature superconductivity is unpredictable...".

The CCPA in In re Marzocchi, 58 CCPA 1069, 439 F. 2d 220, 169 USPQ 367, 369-370 (1971) states:

"The only relevant concern of the Patent Office under these circumstances should be over the *truth* of any such assertion. The first paragraph of §112 requires nothing more than objective enablement. How such a teaching is set forth, either by the use of illustrative examples or by broad terminology, is of no importance.

As a matter of Patent Office practice, then, a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented *must* be taken as in compliance with the enabling requirement of the first paragraph of §112 *unless* there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt does exist, a rejection for failure to teach how to make and/or use will be proper on that basis; such a rejection can be overcome by suitable proofs indicating that the teaching contained in the specification is truly enabling...

[I]t is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain *why* it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement. Otherwise, there would be no need for the applicant to go to the trouble and expense of supporting his presumptively accurate

S.N. 08/303,561

disclosure. [Emphasis in original footnote
deleted].

Applicants have enclosed herewith affidavits of Dr. Mitzi and Dr. Dinger under 37 CFR 132 which state, as quoted above, that once a person of skill in the art knows of applicants' work, the compositions encompassed by the claims under experimentation, can be made using the teaching of applicants without under experimentation.

Thereby rebutting the Examiner's statement that:

"[the specification ... [fails] to provide an enabling disclosure commensurate with the scope of the claims."

S.N. 08/303,561

Rejection of Claims 86-87 and 96-108 Under 35 USC 112, Second Paragraph

Claims 86-87 and 96-108 have been rejected under 35 USC 112, second paragraph.

The Examiner states that:

"The terms 'layer-type', 'perovskite-like', 'earth-like' are vague and confusing."

The Examiner's attention is directed to the specification at page 7, lines 12-15 where it is stated that "substitutions can be found in the rare earth (or rare earth-like) sites, or in the transition metal sites of the compositions. A person of skill in the art would understand this to mean that a location occupied by a rare earth element can also be occupied by another element which would have chemical properties similar enough to the rare earth elements such that it would fit in to the latter site occupied by the rare earth element.

The Examiner's attention is directed to the book entitled "Copper-Oxide Superconductors", Charles P. Poole, Jr. et al., 1988, John Wiley and Sons. The Preface at page V states that "this volume reviews the experimental aspects of the field of oxide

S.N. 08/303,561

superconductivity with transition temperatures between 30°K to above 120°K from the time of discovery by Bednorz and Muller in April 1986 until a few months after the award of the Nobel Prize to them, in October 1987. During this period, a consistent experimental description of many of the properties of the principal superconducting compounds, such as BiSrCaCuO, LaSrCuO, TlBaCaCuO and YBaCuO has emerged" (emphasis added)

This is clear evidence that it is generally accepted that Applicants work initiated the field of high temperature superconductivity and that the other compounds developed behave similarly. At page 78 of this book, it is stated under the heading "Perovskite-type superconducting structures" that "in their first report on high-temperature superconductors, Bednorz and Müller referred their samples as 'metallic oxygen deficient... perovskite-like mixed valent copper compounds.' Subsequent work as confirmed that the new superconductors do indeed have these characteristics. In this section, we will comment on their perovskite-like aspects." This is clear evidence that a person of skill in this art, at the time of applicants' invention, would have understood the meaning of "perovskite-like". In this book, at page 86, under the heading "'Layering Scheme of LrCuO'" it is stated that "when we describe the LrCuO structures were left out, what is perhaps their most important characteristics, their layered aspect." Therefore, it is apparent that a person of ordinary skill in the art at the time of

S.N. 08/303,561

applicants invention, would have understood the meaning of "layer-like." At page 15 of this book, it is stated that "these are cases such as ... in which T_c is less composition dependent and the highest value does not occur at the stoichiometric compositions." Therefore, it is apparent that a person of ordinary skill in the art at the time the invention was made, would understand the meaning of "non-stoichiometric atomic proportion". Copies of the pages corresponding to these quoted sections is attached in Appendix D.

In re Borkowski 164 USPQ 642, 646, the CCPA states that:

[6] "we do not agree ... that claims ... are rendered "unduly broad" or "indefinite" . Moreover, there is no magical relation between the number of representative examples and the breath of the claims; the number and variety of examples are irrelevant if the disclosure is "enabling" and sets forth the "best mode contemplated".

The Examiner further states that "it should be noticed, that at the time the invention was made, the theoretical mechanism of superconductivity of these materials, was not understood. That mechanism is still not understood. Accordingly, there appears to little factual of theoretical basis for extending the scope of the

S.N. 08/303,561

claims much beyond the proportions and materials actually demonstrated to exhibit high temperature superconductivity". Applicants respectfully disagree. It is not necessary that applicants have a theoretical understanding of their invention. The comments herein and in particular the affidavits of Dr. Dinger and Dr. Mitzi, clearly point out that there is a factual basis for extending the scope of the claims beyond the proportions and materials actually demonstrated.

As stated in the affidavit of Dr. Mitzi and Dr. Dinger and the preface of the book by Poole et al., quoted above, the work of Applicants initiated the field of high temperature superconductors. As stated above according In re Fisher "it is apparent that such an inventor should be allowed to dominate future patentable inventions of others where those inventions were based in some way on his teachings." (166 USPQ 18, 24)

The Examiner quotes from Brenner v. Manson, 148 USPQ which states that "a patent is not a hunting license or is not a reward for the search, but a reward for a successful conclusion." Applicants respectfully disagree that this passage is applicable to applicants' situation. In Brenner v. Manson, the issue to which this quotation refers is whether an applicant may patent a chemical process which produces a product for which there is no known use. This is not the case in the above-identified application,

S.N. 08/303,561

therefore, the quoted passage from Brenner v. Manson is not applicable.

Claims 24-26, 86-90 and 96-108 have been rejected under 35 USC 112, first paragraph for the reasons set forth in the rejections to the specification. Claims 24-26 were originally filed in the application, are therefore supported by it since claims are self-supporting. Claims 86-90 and 96-102 are supported by the specification for the same reasons given above, for why claims 103-108 are supported by the specification.

The Examiner queries "will any layered perovskite material containing copper exhibit superconductivity? Also, does any stoichiometric combination of rare earth, an alkaline earth, and copper elements result in an oxide superconductor?"

The claims are directed only to these materials that are superconducting. A claim which covers an inoperative species does not fail to satisfy 35 USC 112. In the present application, none of the species which the claim reads on are inoperative, since the claims only read on superconducting compositions. In *In re Angstadt*, 190 USPQ 214, 119, the CCPA held that inoperative examples do not render claims unpatentable under 35 USC 112.

We hold that the evidence *as a whole*, including the

S.N. 08/303,561

inoperative as well as the operative examples, negates the PTO position that persons of ordinary skill in *this* art, given its unpredictability, must engage in *undue* experimentation to determine which complexes work. The key word is "undue", not "experimentation". 190 USPQ 214, 719 (emphasis on the original)

Claims Rejections Under 35 USC 102

Claims 24-26, 86-90 and 96-108 have been rejected under 35 USC 102 (a) as being anticipated by Asahi Shinbun, International Satellite Edition (London, November 28, 1986). The Examiner states "as discussed in paper number 20 of the ancestral application, 07/053, 307, it is not fully clear to what exact date applicants are entitled. Based on the record, nonetheless, that date would appear to be no later than around December 13, 1986, the date samples were tested in the US to show superconductivity."

Applicants respectfully disagree.

In the Affidavit of Sung Il Park, dated March 30, 1988, at paragraph 4, it is stated "the preparation in measurement of the aforementioned superconducting samples occurred at a date prior to

S.N. 08/303,561

November 15, 1986, and to the best of my recollection, occurred on or about November 9, 1986, the date when a Helium dower was pumped down preparatory to taking the actual measurement." Therefore, since measurements were taken prior to the date of publication of the Asahi Shinbum article, which was November 28, 1986 the invention was reduced to practice in the US prior to the publication date of the Asahi Shinbum article.

In view of these remarks, the Examiner is respectfully requested to withdraw the rejection of claims 24-26, 86-90 and 96-108 under 35 USC 102(a) as being anticipated by the Asahi Shinbum article.

S.N. 08/303,561

Claim Rejection - 35 USC 103

Claims 24-26, 86-90 and 96-108 have been rejection under 35 USC 103 as being unpatentable over Asahi Shinbum article. For the reasons given above in response to the rejection of these claims under 35 USC 102 as anticipated by the Ashahi Shinbum article, that article cannot be considered a reference, therefore, these claims cannot be obvious in view thereof.

In view of these remarks, the Examiner is respectfully requested to withdraw the rejection of claims 24-26, 86-90 and 96-108 under 35 USC 103 as being unpatentable over the Asahi Shinbum article.

The Examiner is respectfully requested to consider this application in view of these remarks and the changes made to the claims. If the Examiner wishes to discuss the application further, or if additional information would be required, the undersigned will cooperate fully to assist in the prosecution of this application.

Respectfully submitted,

A handwritten signature in cursive script, reading "Daniel P. Morris".

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S.N. 08/303,561

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